

How To Use This Manual

Congratulations on your purchase of a new Sports Instruments ECG Professional Series heart rate monitor. This new line of monitors represents a quantum improvement in all aspects of heart rate monitoring technology. Utilizing new materials, new features and new radio transmission technology, the Professional Series monitors are among the most technologically advanced heart rate monitors available.

The Sports Instruments ECG Professional series of watches have been designed to offer large amounts of processed heart rate information in an easy to use, easy to navigate user interface. In the interest of simplicity and reliability, we chose not to make these units PC compatible for the time being. Because of the way your data is presented by the watch, it is quite easy to manually enter all of the information from your ECG Professional watch into any of the many excellent training software programs available on the market. This information may then be easily stored, managed and shared between you and your coach without concerns about compatibility of data.

This manual is laid out in easy to follow sections, which cover the features and functions of your Sports Instruments heart rate monitor. The new ECG Professional units are very advanced monitors and have many unique features and functions. Be sure to read each section carefully so that you will fully understand how the units and its features work.

The manual is divided into sections outlining each of the major functions of the watch. A drawing of the watch screen that represents the starting point or other important screen for each operational process is shown adjacent to the instructions for the process, important keys are shown in color with red indicating PRESS and HOLD and blue indicating PRESS and RELEASE. The steps for the programming or operation are shown below the drawing. Key points and important information are shown in highlighted blocks.

THE HEART RATE MONITOR ITSELF IS AN IMPORTANT PART OF THIS MANUAL AS IT PROMPTS YOU THROUGH ITS OPERATION USING WORDS AND ARROWS SHOWN IN THE PROGRAMMING LINE OF THE DISPLAY.

ENGLISH

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New Features And Functions

5-ZONE AUTOMATIC PROGRAMMING

Sports Instruments offers the world's first heart rate monitor designed for the way you really train. Based on your Threshold Heart Rate or your Maximum Heart Rate the ECG Professional Series automatically calculates 5-training levels based on contemporary training philosophy. The ECG Professional Series then automatically tracks the amount and percentage of time you spend in each training zone during your work out showing you, the zone you are training in, on-screen, in real time. Sports Instruments ECG Professional Series watches are the only watches in the world that calculates your zones using your Threshold heart rate.

5-DAY WORKOUT MEMORY

The ECG 9 features a 5-day automatic memory that automatically stores ALL the information from your last five workouts. Stored information includes—Date of Workout, Time in all five training zones, % of time in each zone, Workload Index for the workout, Lap/Split times with Average, Maximum and Ending heart rate for each lap and split.

ADVANCED PROGRAMMING WINDOW™

The ECG Professional Series features the latest evolution of Sports Instruments patented Programming Window™. A simple interface of words and arrows in the bottom line of the display guides you through every function of the watch. Once you are familiar with the operation of the unit, there is a command that allows you to turn off most of the Programming Window commands, simplifying the operation of the watch.

SMARTMODE™ SYSTEM

Designed to simplify the operation of the watch, the SMARTMODE System selectively deactivates certain displays of the watch when they are not needed. Time of Day, SET, Timers and Workload are all SMARTMODE™ screens.

QUICKVIEW™ ZONE MEMORY

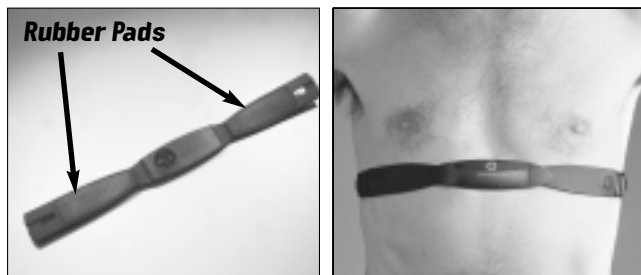
The ECG Professional heart rate monitors are equipped with a dynamic memory system which allows you to track, in real time, the amount of training time you have accumulated in each training zone at the touch of a button.

Wearing the System

WEARING THE SPORTS INSTRUMENTS INDEPAD™ TRANSMITTER BELT

To ensure a proper heart rate display, the chest transmitter must be moistened and properly adjusted. Wet the back of the rubber pads —located to the right and left of the main transmitter case— with saliva or ECG conductive gel. Do not use water, moisturizing creams or suntan oil, as these are insulators and will interfere with the heart rate signal.

Snap the plastic tabs at the end of the elastic belt into the holes at the end of the transmitter and adjust the strap so that the transmitter fits tightly below the pectoral muscles as shown in the drawing.



1. Users with significant chest hair may have a problem obtaining contact between the transmitter electrodes and their skin, resulting in poor performance. It may be necessary for these individuals to shave the area of their chest beneath the transmitter.
2. In dry and cold climates it may take a few minutes of use for the electrodes to soften, and a layer of perspiration to form between the contact and the skin for good performance. Moistening the electrodes with saliva or ECG conductive gel can speed up this process.

Measuring Your Heart Rate

WEARING THE WRIST UNIT

Wear the ECG Professional wrist unit on your right or left wrist as you would any regular wristwatch. The unit is also supplied with a bicycle handlebar mount which will allow you to easily attach it to your bicycle should you desire.

SLEEP MODE

To save battery life, the ECG Professional Series watches are programmed with a sleep function that shuts the heart rate receiver circuit off if the watch has not received a heart rate signal for a period of approximately 10-minutes.

When the watch is in Sleep mode the second line of the heart rate display screens will show 4-dashes (- - -) where the heart rate would normally be displayed.

The Sleep Mode allows full functionality of both timers and chronograph without heart rate input.

ACTIVATE THE HEART RATE CIRCUIT AND BEGIN RECEIVING INFORMATION



1. Put on heart rate transmitter
2. Press the MODE and START/STOP keys at the same time
3. The dashes in the heart rate display will begin to flash sequentially.
4. When the watch has recognized the cheststrap, the display will stop flashing and a heart rate number will be displayed
5. If the unit does not find a local heart rate signal within 30 seconds, the unit will return to sleep mode and the Time of Day screen

Keys And Their Functions

Keys And Their Functions

Each key of the ECG Professional watch has primary functions that are related to the basic operation of the watch and secondary functions that are related to the programming of the watch.

MODE KEY

PRIMARY FUNCTION

Advance Unit Through Main Operational Windows

SECONDARY FUNCTIONS

Change Heart Rate Display from Actual Heart Rate to % Heart Rate

Set a programming variable

Escape from a programming sequence

LAP KEY

PRIMARY FUNCTION

Advances Chronograph or Timer to next timing segment

SECONDARY FUNCTIONS

Change Time of Day display from Time Zone 1 to 2

Access memory playback from Clock/Heart Rate screen

Change the Chronograph display from Lap to Total time display

Change the timer display from Timer 1 to Timer 2

View Maximum and Ending heart rate for each lap during memory playback

START/STOP KEY

PRIMARY FUNCTIONS

Start and Stop the Chronograph and Timer functions

Save Chronograph information to memory

SECONDARY FUNCTIONS

View daily alarm setting

Adjust a programming variable downward

ALARM/EL KEY

PRIMARY FUNCTIONS

Access sequence for programming Target Zone alarm

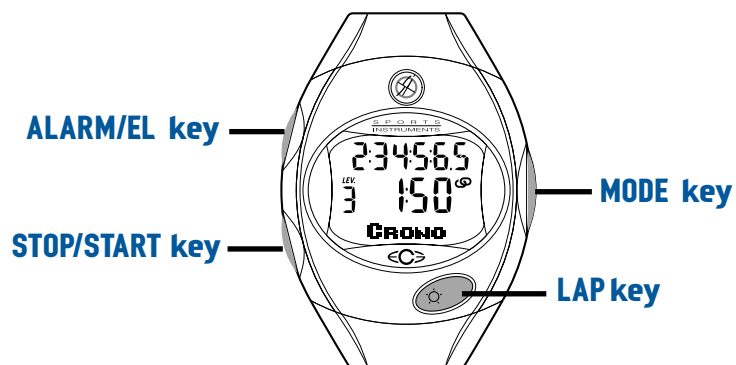
Activate Ultra NightGlow Feature

SECONDARY FUNCTIONS

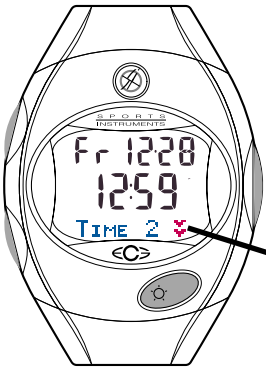
Adjust a programming variable upward

Advance to the next Set window

ECG 7 and 9



Using the Programming Window



The bottom line of all screens is Sports Instruments patented Programming Window. The Programming Window displays information using words, arrows and other symbols to describe what is being shown on screen and which keys you need to press to perform the various functions.

PROGRAMMING WINDOW

Blue indicates viewing option and red indicates action to effect option.

WHAT THE WORDS IN THE PROGRAMMING WINDOW MEAN

Display	Effect
HOLD	Continue to hold the key you are pressing until the screen changes
ADJUST	Change the current programming variable by pressing the key indicated by the arrow
ADJ UP	Change the current programming variable up by pressing the key indicated by the arrow
ADJ DN	Change the current programming variable down by pressing the key indicated by the arrow
SET	Store the current programming variable to memory by pressing the key indicated by the arrow
NEXT	Advance to the next programming variable by pressing the key indicated by the arrow
BACK	View previous screen by pressing the key indicated by the arrow
END	Escape the current sequence by pressing the key indicated by the arrow
SAVE	Store the current information to memory by pressing the key indicated by the arrow

Using the Programming Window

WHAT THE SYMBOLS IN THE PROGRAMMING WINDOW MEAN

Display	Effect
↩ + ↓	(Single Arrow)—Press and Release the key at which the arrow is pointing
↩ ⌘ ↩	(Double Arrow)—Press and Hold the key at which the arrow is pointing for 2-seconds
CLOCK 1A	(Alarm symbol in time of day screen)—Daily alarm is currently active
HE/CLK A1	(Alarm symbol in all other screens)—Training zone alarm is active
CLOCK 2	(1 or 2 in time of day screen)—Time zone currently active
TIME1 A4	(1-5 in all other screens)—Training zone for which alarm is active

OTHER SYMBOLS ON THE MAIN SCREENS

There are also symbols found along the right hand side of the middle line. These are:

Display	Effect
🔗	(Link Icon) (ECG 9 Only)— Indicates the Timers are linked to the Lap Chronograph
🔄	(Repeat Icon) (ECG 9 Only) — Indicates the Timers are programmed to repeat continually
%	(% Icon) — Indicates the display is showing percentage of either Max or AT heart rate.

Main Screens

The ECG Pro Watches have several main operating windows:

SET SCREEN



ECG Professional Series watches are equipped with Sports Instruments exclusive SMARTMODE™ SET Screen. The basic programming functions of the watch are included in this easy to use screen. The SET Screen is only available if the Chronograph is not running. When you are using the SET Screen, programming options are shown in on the lower line. The current settings for the watch are shown in the middle and upper lines. Setting options are: Timers, Chronograph, Alarm, Time, Personal Data, Help and Alert.

Using The SET Screen

1. Advance from Option to Option using the EL Key
2. Choose an Option using the Start/Stop Key

SMART MODE TIME OF DAY SCREEN



This screen shows the time of day as well as the date and day of week. The Programming Window line displays which time zone the unit is using (1 or 2) and the status of the daily alarm. The SMARTMODE Time of Day screen is hidden if either the Chronograph or Timers are running.

When the Time of Day screen is hidden, Time of Day can be found in the Heart Rate/Time of Day screen.

HEART RATE/TIME OF DAY SCREEN



The top line of the Heart Rate/Time of Day displays the time of day on the right, with the number of minutes you have spent in your five training zones on the left. You can scroll through the your 5-training zones in the upper left corner of this screen to see how much time you have accumulated in each zone during your workout at any time. (See page 16: Setting and Using the Training Zone Alarm and Quickview™ Zone Memory.)

Main Screens

CHRONOGRAPH SCREEN



The top line of the chronograph screen displays either your Lap or Split times. The number for each Lap or Split appears in the Programming Window.

In the ECG 9, the Programming Window also displays the number of laps remaining in the memory of the watch whenever the Chronograph is cleared to zero.

SMARTMODE COUNTDOWN/INTERVAL TIMER SCREEN

(ECG 9 ONLY)



The top line of the timer screen displays the settings for timer One and Two. If the timers are not programmed, the SMARTMODE system hides this screen.

SMARTMODE WORKLOAD SCREEN



The Workload display uses your heart rate and other information to calculate a single number which represents the amount of work you have performed during a workout. This feature gives you a simple, easy to use single number for comparing one workout to another in terms of overall effort. When used with Average Heart Rate these two numbers give you a quick overview of load and intensity on a daily basis.

The SMARTMODE Workload screen is only visible if the unit is receiving a heart rate.



The middle line of the Heart Rate/Time of Day, Chronograph, Timer and Workload screens display your current Training level to the left and your actual HR or % HR to the right side of the display.

Setting And Using The Watch

SETTING THE TIME access: Time of Day screen



ECG Professional heart rate monitors allow you to program two separate time zones in either 12 or 24 hour format along with the day of the week and the date. The day and date are on a pre-programmed 50-year calendar for the years 2001-2051. The 50-year calendar automatically accounts for 30 or 31-day months as well as leap years.



Time Zone 2 does not allow you to set the minutes. They are preprogrammed from Time Zone 1

PROGRAMMING STEPS

1. Select Time 1
2. Select 12 or 24 hour
3. Set Hours
4. Set Minutes
5. Set Years
6. Set Month
7. Set Day/Date
8. Select Time 2
9. Repeat 2, 3, 5, 6, 7

SELECTING TIME ZONES access: Time of Day screen



From the Time of Day screen, pressing and holding the Lap key for approximately 2-seconds will cause the unit to switch back and forth between the settings for time zones one and two. The numeral 1 or 2 will appear as the second digit from the right in the Programming Window to indicate which setting is currently showing on display.

SETTING DAILY ALARM access: SET screen



Sports Instruments ECG Professional heart monitors are equipped with a 24-hour daily alarm that can be set to the minute



When alarm is set, it is active for both time zones

PROGRAMMING STEPS

1. Set Hours
2. Set Minutes

Setting And Using The Watch

OPERATING DAILY ALARM access: Time of Day screen



ALARM IS ACTIVE



1. The Alarm will sound for 60-seconds or until a key is pressed
2. Activating the Snooze Alarm will cause the alarm to reactivate after 10 minutes
3. The Snooze Alarm can be reset 6 times (60minutes)

View Alarm Setting—Press and Hold the Start/Stop key.

Turn Alarm On/Off—Continue to Hold the Start/Stop key. Status (On/Off) cycles every 3-seconds and is shown by the words ON and OFF in the Programming Window

TURN ALARM OFF WHEN SOUNDING

1. Press Mode, Start/Stop or EL key to turn alarm off completely.
2. Press Lap key to activate Snooze Alarm.

SETTING PERSONAL DATA access: SET screen



The Data screen manages the your personal information that is used to calculate your zones, heart rate percentages and workload.

Select either Maximum Heart Rate or your Anaerobic Threshold Heart Rate as the basis for your zones



1. If the Time of Day is set in 24hr mode, your weight must be entered in kilograms. If 12hr mode is set, enter your weight in pounds.
2. You must know your Anaerobic Threshold heart rate exactly as the watch is not capable of estimating this number.

(See page 21: Determining your Anaerobic Threshold)

PROGRAMMING STEPS

Using Anaerobic Threshold Heart Rate

1. Enter AT heart rate
2. Enter Gender – Male or Female
3. Enter Weight – Pounds/12 hr mode or Kilograms/24 hr mode

Using Maximum Heart Rate

1. If known—Enter Maximum Heart Rate
2. If Maximum Heart Rate is not known press the MODE key
3. Enter Age – in Years
4. Enter Gender – Male or Female
5. Enter Weight – Pounds/12 hr mode or Kilograms/24 hr mode
6. Unit will automatically estimate and set a Maximum Heart Rate for you and display it on the screen for 5-seconds

Setting And Using The Watch

TURNING HELP ON AND OFF access: SET screen



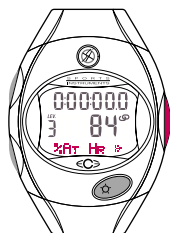
Once you are familiar with the operation of the watch and no longer need all of the operating messages that are displayed. You can disable many of the messages in the Programming Window.

1. Top line of the display shows the current status of the Help
2. Press EL key to change status

The messages in the SET window are always active regardless of the status of HELP as are certain other messages depending on the mode.



VIEW HR NUMBER OR HR PERCENTAGE access: any HR screen



Your ECG Professional watch is capable of displaying either your heart rate number or your heart rate expressed as a percentage of either your Maximum or Anaerobic Threshold heart rates. Depending on which you chose in the DATA Sequence.

To change between your actual heart rate and a calculated percentage, Press and Hold the MODE key in any heart rate screen. When a calculated percentage is being shown the percent icon will be activated at the right edge of the display.

1. To Start and Stop the chronograph press and release the Start/Stop key
2. To Advance chronograph to next Lap or Split press and release the Lap key
3. To Save a workout Press and Hold the Start/Stop key for a period of approximately 2-seconds after chronograph has been stopped

- !
1. If you are viewing % of AT it is possible for the display to exceed 100%.
 2. You may change between % HR and Actual HR at any time.

USING THE KEY PRESS ALERT access: SET screen



This feature allows you to activate or deactivate a tone to occur each time you press on of the keys.

1. Key alert status is shown in upper line
2. Press and Release EL Key to change status
3. Press and Release MODE key to set status



Setting And Using The Watch

SETTING AND USING THE CHRONOGRAPH FUNCTIONS

SETTING THE CHRONOGRAPH DISPLAY access: SET screen



The ECG Professional Series watches allow you to program the chronograph to view your time in different ways. You have the option of viewing either your Lap Times or your Split Times. This function only affects the way that you are viewing the chronograph during timing. The watch will retain both Laps and Splits in memory at all times.



TOP LINE OF THE DISPLAY SHOWS THE CURRENT STATUS OF THE CHRONOGRAPH



PRESS EL KEY TO CHANGE STATUS

TIMING WITH THE CHRONOGRAPH:

1. To Start and Stop the chronograph press and release the Start/Stop key
2. To Advance chronograph to next Lap or Split press and release the Lap key
3. To Save a workout Press and Hold the Start/Stop key for a period of approximately 2-seconds after chronograph has been stopped

WHEN THE CHRONOGRAPH IS SET TO DISPLAY LAPS



A Lap is a discrete segment of time since the chronograph has been started (Lap 1) or since the end of the previous lap

1. Pressing and releasing the LAP key, any time after the chronograph has been started, will cause the unit to display the time of the previous lap for a period of 5-seconds. Following this, the time of the next lap will be displayed starting at 5-seconds
2. Pressing and holding the LAP key will change chronograph display to show the Total Time of the workout on screen with laps recording in the background. In this mode, pressing and releasing the LAP key will cause the unit to display the time of the previous lap for a period of 5-seconds. Following this, the total time of the workout will be displayed.
3. You are free to change from lap to total time displays at any time you wish by pressing and holding the LAP key.

WHEN THE CHRONOGRAPH IS SET TO DISPLAY SPLITS



A Split is the cumulative total of all previous Laps. The Split Chronograph display is visually the same as the Total Chronograph display. The Split Chronograph is different in how it responds to the Press and Release of the LAP key.

1. Pressing and Releasing the LAP key, any time after the chronograph has been started will cause the unit to display the most recent split for a period of 5-seconds. Following this, the chronograph will display the updated total time for the workout.



The Programming Window of the watch will display Lap, Total or Split Chrono to inform you which timing view is being displayed as well as the number of the lap or split currently being timed.

When you reach the last 6 laps of available memory (94-100 in the ECG 7 and 219-225 in the ECG 9) the watch will sound 6 quick warning tones.

Setting And Using The Watch

SETTING AND USING THE TRAINING ZONE ALARM AND QUICKVIEW™ ZONE MEMORY

TRAINING ZONE ALARM access: any HR screen



The ECG Professional Series are equipped with an audible alarm that beeps, when you are IN your chosen training zone. The Training Zone Alarm can be set for any of the five training zones or OFF.



! Zone Alarm

1. Alarm settings are shown in the Programming Window. When setting the Training Zone Alarm, all other information in the Programming Window is disabled
2. The initial Alarm option is always OFF

1. The Training Zone Alarm can be accessed from any heart rate screen by a 2-second Press and Hold of the EL key
2. Press EL key to advance through the zones
3. Press MODE to select a zone

QUICKVIEW™ ZONE MEMORY access: HR/Time of Day screen

When you are in the Heart Rate/Time of Day screen, the two digits in the upper left of the top line will display, in whole minutes the amount of time that you have accumulated in the zone for which the alarm is currently set. When you are changing the alarms, this display will change to show you the amount of time you have accumulated in each zone during your workout

USING THE ULTRA NIGHTGLOW™ FEATURE access: any screen except SET

The ECG Professional watches are equipped with Sports Instruments Ultra NightGlow display backlight to aid viewing in low light conditions. Unlike other backlights, the Ultra NightGlow display lights only the digits rather than the whole display.

When activated, the Ultra NightGlow feature automatically remains lit for 5-seconds. Pressing any key while the NightGlow is activated automatically resets the 5-second timer. This allows the user to operate or program the unit in total darkness if necessary.

Because operational constraints, for the Ultra NightGlow feature to be used in the SET window, you must activate the feature prior to entering this area of the watch. Once you are in the SET area, the Ultra NightGlow light will remain lit as long as you press a key within the 5-second time frame

CAUTION: Excessive use of the NightGlow Backlight (more than once per day) will reduce battery life to less than one year.

Using Workout Memory Functions

ACCESS WORKOUT MEMORIES access: HR/Time of Day screen



The memory of the ECG Professional Series watches is accessed from the Heart Rate/Time of Day screen by pressing and holding the Lap key for 2-seconds.

The command for accessing the memory is only visible if the chronograph has been turned off and all of the information on the display has been stored.

MULTIPLE FILE MEMORIES (ECG 9)



The ECG 9 is equipped with 5 individual memory files. Unlike other heart rate monitors that only store a portion of your workout information in long-term memory, the ECG 9 stores all of the information from your five most recent workouts.

The multiple memories are automatic and do not require any attention from the user. Once the unit has stored 5 files, the storage of a 6th file will automatically delete the oldest file stored in memory.

If the new file being stored has recorded more laps than are made available by deleting the oldest file the unit will automatically delete as many files as are necessary to accommodate the new file

Even if all laps have been used in a previous file(s), the ECG 9 retains enough memory to allow you to store up to four subsequent workouts that record your training zone information and the total time for the workout.

Using Workout Memory Functions

MEMORY FILE PLAYBACK DETAIL

The ECG Professional series watches give you detail during memory playback that you cannot get from any other heart rate monitor. When you playback the memory, you will have access to the following information:



The top line of the first five screens show you the time that you have accumulated in each of your five training zones.

The middle line shows you the zone you are viewing on the left and the percentage of total time that you have spent in the zone on the right.

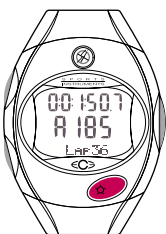
The bottom line shows you the range in beats-per-minute for each of the training zones



The top line of the sixth screen in the sequence shows you the total time for your workout.

The middle line shows you your average heart rate (preceded by the letter A) for the whole workout.

The seventh screen shows your Workload Index for the workout.



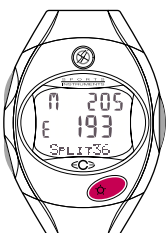
Subsequent screens show your times for each lap that you have timed during the workout in the top line.

The middle line shows your Average Heart Rate for the lap in display.

When you are viewing a Lap, pressing and releasing the Lap key switches the top line of the display to show the Split time that corresponds to that Lap.



VIEW SPLITS IS SELECTED



Pressing and holding the Lap key when you are viewing either the Lap or the Split time causes the display to show your Maximum (M) and Ending (E) heart rates for each lap or split.

Special Functions of the ECG 9

SETTING AND USING THE COUNTDOWN TIMER FUNCTIONS

The ECG 9 is equipped with dual countdown timers for doing timer based and interval type workouts. The operation of the timers is extremely flexible and allows for the development of many different workouts

SETTING THE COUNTDOWN/INTERVAL TIMERS access: SET screen



PROGRAMMING STEPS

1. Set Minutes for Timer One
2. Set Seconds for Timer One
3. Set Minutes for Timer Two
4. Set Seconds for Timer Two



5. Select if Timers will Repeat

TIMERS SET TO REPEAT

Activating Repeat Timers, programs the timers to continually cycle until stopped by the user. If only Timer 1 is set, it will repeat the same time continually. If both Timer 1 and 2 are set, they will repeat in sequence.



6. Select if Timers are to be Linked to the Chronograph

TIMERS ARE LINKED

The Link Timers function ties the timers to the operation of the Lap Chronograph. This function and its uses will be described in detail later in the manual. Most of the time you will keep the timers linked to the Chronograph.

! COUNTDOWN TIMERS

1. You may program Timer 1 alone or Timer 1 and Timer 2 together. Timer 2 cannot be programmed alone.
2. If you want to program the times for less than one-minute, simply advance past the minutes by pressing the MODE key.
3. Seconds can only be programmed in 5-second increments
4. Minutes and Seconds can be fast advanced by Pressing and Holding the EL or START/STOP key

Special Functions of the ECG 9

OPERATE THE COUNTDOWN TIMERS

LINK THE COUNTDOWN TIMERS TO THE LAP CHRONOGRAPH

Linking the Timers to the Chronograph allows you to easily track your warm-up, cool-down, breaks and timer workouts.

By themselves, the timers do not have memory capability. To store heart rate information based on the timers they must be linked to the chronograph.

When the Timers and Chronograph are linked, every time the timer advances, the chronograph also advances another lap.

The chronograph may be started prior to the timers (to track your warm-up) and advanced as many laps as desired (up to the capacity of the memory). When you change to the Timer screen and begin a Timer the Chronograph automatically advances another lap.

When you stop the Timers, the Chronograph automatically advances another lap allowing you to track your cool-down.

If the Timers are set to repeat and are linked, the Chronograph will advance each time the Timers advance until the timers are stopped. When controlled by the Timers, the Chronograph function is automatic and it will not respond to key inputs. You must stop the Timer(s) using the START/STOP key to return the Chronograph to normal operation.

COUNTDOWN TIMER TONES

At the end of a timing segment, the audible alarm will sound in the following manner for the final 4 seconds:

Timer 1: 2 short tones followed by one long tone.

Timer 2: 2 short double tones followed by one long tone.

When the Timers are set for 30 seconds or less, the tone is disabled.

VIEW TIMER 1 OR 2



With the timers stopped Press and Release the LAP key in the **TIMER** screen

! COUNTDOWN TIMERS

1. If Timer 2 has not been programmed there will be no message indicating it in the Programming Window
2. You can start timing from either Timer 1 or Timer 2 by Pressing and Releasing the START/STOP key

Training With Your ECG Professional Watch

DETERMINING YOUR ANAEROBIC THRESHOLD HEART RATE.

One of the unique features of your watch is the ability to program training zones using your Anaerobic or Lactate Threshold (AT or LT) heart rate (for our purposes these two terms are interchangeable). These thresholds represent the heart rate number which corresponds to the point, during exercise, where your body is no longer capable of supplying all of its energy needs using oxygen. Above this heart rate, Lactic Acid begins to accumulate in your blood and muscles and ultimately will require you to reduce your exercise intensity in order to keep performing. Establishing your training zones using your AT or LT heart rate allows you to be significantly more specific during your training than the more traditional use of Maximum Heart Rate. This is because AT and LT are variable and will increase with your fitness, allowing ongoing modifications to your zones. As a serious athlete, increasing your fitness means increasing your AT or LT. To do this you must train regularly at, or slightly above, these levels. If you have established your zones using your maximum heart rate you may very well be training at intensities too low to achieve the most from your training.

The best way to determine your AT/LT is by being tested in an exercise lab. As AT and LT vary slightly depending on activity, it is best to have the test performed using a protocol that matches the type of exercise you will be performing. For example, if you are a cyclist you should be tested on a bicycle ergometer. If you are a runner, you should be tested on a treadmill. While performing the test, the technicians will take blood samples from your index finger at set intervals as you exercise. When you have completed the test, they will be able to tell you your AT/LT as well as your maximum heart rate. Unfortunately, these tests tend to be expensive and require access to a physiology test lab.

It is easy to get a close estimate of your AT/LT. If you are a competitive endurance athlete and currently are using a heart rate monitor, you probably already have a good idea what your AT/LT is. For runners or Nordic skiers it is going to be very close to the heart rate you average for a 10k race. For cyclists it is the heart rate you average for a 30-40k time trial and for swimmers it is the heart rate you average for a 1500m fast swim. Actually, your AT/LT is probably slightly below these numbers as you will normally compete slightly above your actual AT/LT but for purposes of setting the watch, it is a good estimate.

Don't forget that you will need to adjust your AT/LT setting as your fitness improves.

TIMER INTERVAL TRAINING (ECG 9 ONLY)

The ECG Professional 9's timer system allows you significant flexibility for creating interval and other timer-based workouts. For example, you can set up an interval workout using both timers, setting the first timer for your work session and the second timer for your recovery session. You can begin your workout using Lap 1 of the chronograph to time your warm-up, then move to the timer screen to begin your intervals.

Starting Timer 1 automatically advances the chronograph to Lap 2 and subsequent laps as the timers advance. After you finish your first set of intervals, stop the timers. The unit automatically advances to the next lap and tracks your recovery time between sets. After you have recovered you can return to the timer screen to begin set two. When you have finished set two, you may return to the chronograph to manage your recovery. When you play back the memory from the workout you will have accurate information regarding your warm-up, your cool-down, your intervals and your periods between interval sets all in the order that they happened. To set up an interval session by following these steps:

1. Set Timer 1 to the time you want for the Active portion of your interval
2. Set Timer 2 to the time you want for the Rest portion of your interval
3. Set the Timers to "Repeat" and to "Link" to the chronograph.
4. Start the chronograph and warm-up
5. When you are ready to begin your interval session, advance to the Timer Screen and start Timer 1. The timers will automatically cycle through the active and rest portions of the interval.
6. When you stop the timers at the end of your workout, the watch will automatically advance the chronograph one more lap allowing you to track your cool-down
7. You can start Timer 1 again if you wish to perform a second set of intervals

THREE-MINUTE RECOVERY

Keeping track of your heart rate at the end of a three-minute period following a hard effort is an excellent relative indicator of your fitness. This is best tracked as the last rest segment of an interval workout. To do this with your heart monitor simply stop the timer following your last Active portion of your interval session, go to the chronograph and track three minutes and press the LAP key. The watch will automatically record your final heart rate at the end of the 3-minute recovery. Keep track of the 3-minute recovery heart rate number and it will give you a reference point for your fitness.

HEART RATE SAMPLING (ECG 9 ONLY)

The ECG Professional 9 is capable of taking up to 225 heart rate samples at any time interval that you desire. To take a heart rate sampling following these steps:

1. Check the number of laps remaining available in memory.
2. Set only Timer 1 for the sampling rate you desire anywhere from 5 seconds to 24hours.
3. Set Timer 1 to Repeat and to be Linked to the chronograph.
4. When you begin your workout, start from the Timer screen and start the timer when you desire to begin sampling.
5. The watch will automatically advance the lap chronograph at every sampling interval. At the end of the workout you will have your Average, Maximum and Last heart rate number for each sampling interval as well as your full training zone information.

ECG Professional 9 is capable of holding the following amounts of data at these sampling rates:

Sample @ 5-seconds—18m 45s of data

Sample @ 15-seconds—56m 15s of data

Sample @ 30-seconds—1h 52m 30s of data

Sample @ 1-minute—3h 45m of data

Training With Your ECG Professional Watch

HEART RATE TRAINING RANGES

The ECG Professional watches automatically use the following ranges to determine your training zones:

HEART RATE TRAINING ZONES	USING MAXIMUM HEART RATE	USING ANAEROBIC THRESHOLD HEART RATE
LEVEL 1	30beats—70% of MHR	30beats—81% of AT
LEVEL 2	71—75% of MHR	82—88% of AT
LEVEL 3	76—80% of MHR	89—93% of AT
LEVEL 4	81—90% of MHR	94—100% of AT
LEVEL 5	91—100% of MHR	101—106+% of AT

In the interest of functional simplicity, we chose to use pre-programmed percentages for the calculation of your training zones. These ranges are based on input from some of the best literature and coaches available. Because zone training is not really an exact science, these ranges should be perfectly adequate for almost any athlete. With the exception of your Anaerobic Threshold work, training zones are best utilized as guidelines for establishing and verifying the amounts of rest/recovery and intensity you perform on an overall basis, not as an absolute. In the course of any typical workout, it will be very hard to adhere tightly to a specific individual zone and you will find yourself drifting in and out of any zone from time to time as dictated by outside influences. As stated earlier, the exception to this is your threshold work, which should be quite specific, and should be performed no more than a couple of beats to either side of your Anaerobic Threshold. This is why we have the ECG Professional watches set the top of Zone 4 at 100% of your Anaerobic Threshold. The display of the watch makes it easy for you to train right at your AT for optimal training efficiency.

If you are working with a coach, you may find that their zone ranges vary slightly from the percentages used by your watch. Usually, these variations will be fairly slight and shouldn't be difficult to work around.

The following references will help you develop your training program:

Websites and Software:

www.crosstrak.com
www.trainingbible.com
www.fitcentric.com

Reading:

Cyclists Training Bible – Joe Friel
Triathletes Training Bible – Joe Friel
Mountain Bikers Training Bible – Joe Friel
Serious Training for Endurance Athletes – Rob Sleamaker and Ray Browning
Precision Heart Rate Training – Edmund Burke
Road Racing for Serious Runners – Pete Pfiztinger, Scott Douglas, Bill Rodgers
Training Plans for Multisport Athletes – Gale Bernhardt
The Heart Rate Guide Book to Zone Training – Sally Edwards
Periodization Training for Sports – Tudor Bompa

Warnings and Cautions

WARNING—Sport Instruments heart rate monitors are training and fitness tools. Before beginning any exercise program, consult your doctor for a complete physical and to discuss your exercise plans

CAUTION—Sports Instruments heart rate monitors are highly accurate and sophisticated technical instruments. To ensure continued proper operation and to maintain a waterproof seal, we recommend that only a qualified Sports Instruments technician replace the battery in the watch unit. Improper replacement or reassembly may damage the watch and void the manufacturer's warranty.

NOTICE TO SWIMMERS—The ECG Professional series heart monitors are designed to be water resistant. This means that water should not enter the unit during normal swimming. However, care should be taken not to press the keys while the unit is submerged or wet as this may cause water to be forced past the key seals damaging the unit. However, operating heart rate monitors while in the water may cause other operational problems for a variety of other reasons. First, water may interfere with the ability of the chest strap to detect a heart rate signal from the body. Second, water-resistance encountered while swimming will often cause the chest strap to pull away from the body or be forced to a location where it is impossible for it to detect a heart rate signal. Overall, the percentage of people who experience problems using a heart rate monitor will be much higher when the unit is used in a water environment.

NOTICE TO PEOPLE THAT WEAR PACEMAKERS—While your heart rate monitor should have no direct effect on your pacemaker, we strongly recommend that you consult your physician or cardiologist before using this product or embarking on an exercise program.

CARE AND MAINTENANCE

Sports Instruments heart rate monitors are highly sophisticated electronic instruments containing many delicate components. It may be damaged by excessive exposure to heat, shock or general abuse. Treated with care your monitor is capable of delivering many years of reliable service.

ALWAYS—Rinse your ECG transmitter in warm water after each use

NEVER—Lay your ECG transmitter on metal surfaces, as this can shorten the battery life.

NEVER—Store your ECG transmitter or watch in a plastic or other non-breathable container.

NEVER—Press the keys of the watch unit if it is wet or under water.

Specifications And Ranges

WATCH FUNCTIONS

Time of Day
Two Time Zone Settings
Day/Date with 50-year Perpetual Calendar
24-hour Daily Alarm with "Snooze" Function

HEART RATE FUNCTIONS

Instantaneous Heart Rate
Percentage of Maximum and Anaerobic Threshold Heart Rate
5-Automatically Programmed Training Zones
Real Time Training Zone Display
Training Zone Alarm

TIMING/TRAINING FUNCTIONS

Chronograph: ECG 9 225-Lap 200-Hour ECG 7 100-Lap 200-Hour
Chronograph View: Lap/Total Time or Split Times
Timers: ECG 9 only

MEMORY FUNCTIONS

5-Day Date-Coded Automatic Workout Memory (1-Day for ECG 7 Professional)
Heart Rate Ranges for Each Training Zone
Total Time Spent in Each Training Zone
Percentage of Time Spent in Each Training Zone
Average, Maximum and Ending Heart Rate for Each Lap and Split
Average and Maximum Heart Rate for Total Workout

OTHER FUNCTIONS

Workload Index
Advanced Programming Window
Ultra-NightGlow

ALGORITHMS USED FOR CALCULATION

Estimated Maximum Heart Rate
Male— $210 - (1/2 \text{ Entered Age}) - (.05 \times \text{entered weight in pounds}) + 4$
Female— $210 - (1/2 \text{ Entered Age}) - (.05 \times \text{entered weight in pounds})$

Conversion of weight in pounds to kilograms and back
Weight in Pounds times 2.2

Training Zone Ranges Using Maximum Heart Rate
Maximum Heart Rate times Heart Rate %

Training Zone Ranges Using Anaerobic Threshold Heart Rate
Anaerobic Threshold Heart Rate times Heart Rate %

Specifications And Ranges

TECHNICAL SPECIFICATIONS

TRANSMITTER

Battery Type: CR2032 3v Lithium
Battery Life: 1 year
Operating Temperature: 14 F to 122 F/-10 C to 50 C

WATCH UNIT

Battery Type: CR 2025 3v Lithium
Battery Life: 1+ year
Operating Temperature: 14 F to 122 F/-10 C to 50 C
Water Resistance: 2ATM

PERFORMANCE RANGES

Time of Day: 12 or 24-hour formats with one-minute resolution
Daily Alarm: 24-hours with one-minute resolution
Calendar: 50-years 2001-2051
Heart Rate Display: 30-240 Beats per Minute (BPM)
Average Heart Rate Display: 30-240 BPM
Maximum Heart Rate Display: 00-240 BPM
Anaerobic Threshold Heart Rate Display: 100-240 BPM
Age Display: 10-99 Years
Weight Display: 60-999Lbs / 27-454Kg
Exercise Time (Chronograph): 199h 59m 59s—0.1 Second Resolution
Countdown Timers: 23h 59m 59s—1.0 Second Resolution

LAP CAPACITY

ECG 9 Professional: 225
ECG 7 Professional: 100

WORKLOAD CAPACITY

9,999units

Manufacturer's Warranty

This warranty gives the purchaser specific legal rights. The purchaser may also have other rights depending on state law.

Sports Instruments, Inc. hereby warrants to the original purchaser that the product sold by it is free from defects in the material and workmanship for the period of two (2) years from the date of purchase. The obligations of Sports Instruments, Inc. under this warranty are limited to the repair and replacement of such part or parts of the unit as shall be found upon inspection to be defective in material or workmanship. Individual models may differ in parts covered under warranty. Repair and replacement of any part found defective shall be at Sports Instruments, Inc.'s sole option.

The warranties contained herein are expressly in lieu of any other warranties, including implied warranty of merchantability and/or fitness for purpose.

Sports Instruments reserves the right to change product specification without notice.

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Note: Damage caused as a result of service by unqualified persons is not covered and will void warranty.